

REMARKS

Claims 1-17 are now pending in the application. Claims 15-17 were allowed. Claims 3-7 and 10-14 were indicated as allowable. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 1, 2, 8, and 9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Nakaniwa (U.S. Pat. No. 5,227,975). This rejection is respectfully traversed.

With respect to claim 1, Nakaniwa fails to teach or suggest a controller that monitors a signal generated by the oxygen sensor, that determines a rate of change of the signal, that computes at least one diagnostic parameter based on the rate of change and that indicates a malfunction of the oxygen sensor if diagnostic parameter is smaller in magnitude than a corresponding threshold.

The diagnostic system of the present invention determines whether the exhaust sensor is properly functioning based on a slope or rate of change on the inlet oxygen sensor signal. More specifically, the diagnostic system calculates the slope (both positive and negative) as the signal transitions from low to high or high to low. The diagnostic system determines whether there is a sensor malfunction based on the slope.

As best understood by Applicants, Nakaniwa discloses an air/fuel ratio feedback control diagnostic system that determines whether an oxygen sensor is faulty by analyzing the cycle time of the wave form of the sensor signal. More specifically, Nakaniwa calculates the cycle time of the signal by measuring the time interval across peaks of the signal waveform. If the cycle time is not within a specified range, the sensor is determined to be defective (Col. 23, Lines 50-54,63-68). Therefore, Nakaniwa fails to teach or suggest a controller that determines a rate of change of the signal. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Claim 2 is dependent upon claim 1 and is allowable for at least similar reasons.

With respect to Claim 8, Nakaniwa fails to teach or suggest monitoring a signal generated by an oxygen sensor, determining a rate of change of the signal, computing at least one diagnostic parameter based on the rate of change and indicating a malfunction of the oxygen sensor if diagnostic parameter is smaller in magnitude than a corresponding threshold.

As discussed above, the diagnostic system of the present invention determines whether the exhaust sensor is properly functioning based on a slope or rate of change on the inlet oxygen sensor signal. More specifically, the diagnostic system calculates the slope (both positive and negative) as the signal transitions from low to high or high to low. The diagnostic system determines whether there is a sensor malfunction based on the slope.

As best understood by Applicants, Nakaniwa discloses an air/fuel ratio feedback control diagnostic system that determines whether an oxygen sensor is faulty by analyzing the cycle time of the wave form of the sensor signal. More specifically, Nakaniwa calculates the cycle time of the signal by measuring the time interval across peaks of the signal waveform. If the cycle time is not within a specified range, the sensor is determined to be defective (Col. 23, Lines 50-54,63-68). Therefore, Nakaniwa fails to teach or suggest a controller that determines a rate of change of the signal. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Claim 9 is dependent upon Claim 8 and is therefore allowable for at least similar reasons.

ALLOWABLE SUBJECT MATTER

Claims 15-17 were allowed.

The Examiner states that claims 3-7 and 10-14 would be allowable if rewritten in independent form. However, Applicants have presently refrained from rewriting any of claims 3-7 and 10-14 in view of the discussion above. Applicants reserve the right to amend Claims 3-7 and 10-14 into their originally allowable form at a later date if needed.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If for some reason a fee needs to be paid please charge Deposit Account No. 07-0960 for the fees, which may be due.

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Respectfully submitted,

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